

The Office Action rejects claims 1-17 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,729,077 to Newnham et al., hereafter Newnham. This rejection is moot as to claim 9, which was canceled by the Amendment filed on June 28, 2002.

This rejection is erroneous because Newnham does not disclose elements or a step that are recited in independent claims 1, 10 and 17. Newnham does not disclose or teach an electro active device comprising first and second electro active substrates to which first and second electric fields are applied, the first and second electric fields having an amplitude and phase relationship such that the electro active device produces a combined flexural and bending motion generating a directional beam as recited in each of these claims.

Newnham's electro active transducer produces an omni-directional beam having a pure flextensional mode similar to the characteristic shown in Fig. 5A of the present application. That is, Newnham's substrate is excited by an electric field that causes a flexural motion thereof in a radial direction, which is converted to a flexing motion (up and down) in end caps 30 and 32. There is no bending motion of the substrate, i.e., in the axial or thickness direction thereof.

In contrast, the electro active device of the present invention has separate electric fields applied to the back to back substrates, the separate electric fields having an amplitude and phase relationship such that the electro active device produces a combined flexural (radial) and bending (axial) motion that provides a directional beam. The directional beam has a characteristic like that shown in Fig. 5C of the present application. Claims 1 and 17 recite the structural relationship of two electro active substrates, three electrodes and first and second circuitry that provides the separate electric fields, the combined flexural and bending motion and the directional beam. Method claim 10 recites the steps of applying the separate electric fields.

For the reason set forth above, it is submitted that the rejection of claims 1-8 and 10-17 under 35 U.S.C. 102(b) as anticipated by Newnham is erroneous and should be withdrawn.


Attached hereto is a marked-up version of the changes made to the specification and claims by the present amendment. The attachment is captioned "Version With Markings To Show Changes Made."

It is respectfully requested for the reason set forth above that the rejection under 35 U.S.C. 102(b) be withdrawn, that claims 1-8 and 10-17 be allowed and that this application be passed to issue.

For the reasons set forth above, it is submitted that this amendment places the application in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and passed to issue. If this amendment is deemed to not place the application in condition for allowance, it is respectfully requested that it be entered for the purpose of appeal.

Respectfully Submitted,

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